

Serial No.: 09/869,987
Reply to Office Action of: June 11, 2003
Atty. Docket No.: JHT-0002

REMARKS

The Examiner will note that claim 1 has been amended by incorporating the bulk metal catalyst formula from claim 2 into claim 1.

Claims 1-16 were rejected under 35 USC § 103(a) as being unpatentable over Sawyer (EP 419266) in view of Velenyi (U.S. 4,808,563).

The Sawyer reference was cited as disclosing a process whereby a feedstock is hydrotreated in the presence of a hydrotreating catalyst under hydrotreating conditions wherein the hydrotreating catalyst comprises a non-noble Group VIII metal molybdate (page 4, lines 19-24). The reference discloses hydrotreating conditions equivalent to the range 288°C to 371°C, pressure in the range of 300 to 1200 psig, liquid hourly space velocity in the range of 0.5 to 4.0, and a hydrogen treat gas rate in the range of 200 to 2000 SCF/B (page 5, lines 32-40). The reference also discloses a process wherein hydrotreating removes sulfur and nitrogen containing compounds and solvent contaminants (page 3, lines 19-26 and 40-50), and further discloses a process wherein the hydrotreating catalyst comprises at least one of molybdenum and tungsten and at least one of cobalt and nickel (non-noble Group VIII metals, page 4, lines 19-27).

The Velenyi reference was cited as disclosing a bulk metal hydrotreating catalyst with the formula $Mo_a W_b M_c A_d O_e$.

The Examiner first concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Sawyer to utilize the bulk metal catalyst of Velenyi because both the Velenyi and the Sawyer catalysts are suitable and effective for hydrotreating. In response, it is first noted that Sawyer is directed to slurry hydrotreating and Velenyi to a process for converting gaseous reactants comprising methane and oxygen to higher order hydrocarbons (see Abstract). The processes of the respective references are completely different and applicants are unable to find any teaching in Velenyi that his catalyst is suitable for hydrotreating. Second, Velenyi requires the presence of oxygen (col. 9, line 14) and the

Serial No.: 09/869,987
Reply to Office Action of: June 11, 2003
Atty. Docket No.: JHT-0002

combination of oxygen with hydrogen in a hydrotreater is very unlikely due to safety concerns. Thus one skilled in the art of hydrotreating would not look to Velenyi for teachings relevant to hydrotreating as Velenyi is an oxidative process. Third, the catalyst of Velenyi requires an "A" component not present in applicants' catalyst and the "M" component covers Cu, Ag, Au, Zn, Cd, Hg, Ti, Zr, Hf, V, Nb, Ta, Fe, Co, Ni, Y, Cr, Mn, Re, B, In, Ge, Sn, Pb, Th, U and mixtures thereof. There is nothing to lead one skilled in the art to suggest the bulk metal catalyst defined in amended claim 1.

The Examiner next states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein at least a portion but less than all of the molybdenum is replaced by tungsten because as transition metals molybdenum and tungsten have similar properties and because both are utilized in the bulk metal catalyst. In response, this grounds for rejection is not understood. If Mo and W have similar properties as suggested by the Examiner, what would motivate one skilled in the art to replace to make such a replacement? The results of W addition to Ni/Mo catalyst is demonstrated in the specification in Examples 5 and 6.

The Examiner next concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the bulk metal catalyst is represented by the formula $(X)_b(Mo)_c(W)_d(O)_z$ and wherein X in the formula $(X)_b(Mo)_c(W)_d(O)_z$ is a non-noble Group VIII metal, the molar ratio of $b:(c+d)$ is 0.5/1 to 3/1, the molar ratio of $c:d$ is $>0.0/1$, and $z = [2b + 6(c+d)]/2$ because the Velenyi reference discloses the constituent components of the catalyst, and since all constituent components are disclosed, it would be appropriate to adjust them in any ratio effective for hydrotreating. In response, as noted previously, the Velenyi catalyst is not the same as applicants' catalyst and is used in an oxidative process for methane conversion to higher order hydrocarbons. There is no suggestion of hydrotreating in Velenyi and no suggestion of eliminating an essential component thereof (component "A").

Serial No.: 09/869,987
Reply to Office Action of: June 11, 2003
Atty. Docket No.: JHT-0002

The next conclusion is that it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the full range of temperature from 200 to 400°C, pressure from 150 to 3500 psig, liquid hourly space velocity from 0.5 to 5 and hydrogen treat gas rate in the range of 100 to 5000 scf/B (17.8 to 890 m³/m³) because overlapping ranges are disclosed by Sawyer and it would be appropriate to adjust the ranges for effective hydrotreating. In response, Sawyer teaches a slurry liquid process and Velenyi relates to a gas phase reaction. The differences are apparent in the respective temperatures (288 to 371°C, preferably 316 to 343°C (pg. 5, line 34) vs. 250 to 1000°C, preferably 500 to 750°C (col. 9, lines 64-65)), and space velocities (0.5 to 4 hours (pg. 3, line 38) vs. 0.05 to 20 seconds (col. 10, lines 5-6)).

The next conclusion is that it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the hydrofining catalyst contains from 5 to 95 wt.%, based on hydrofining catalyst, of a hydrotreating catalyst containing at least one Group VIB and at least one non-noble metal Group VIII metal on a refractory oxide support because both Sawyer and Velenyi disclose the constituent components of the catalyst, and it would be appropriate to adjust the weight percentage in whatever way necessary for hydrotreating. In response, applicants' catalysts are unsupported (specification, page 20, lines 17-18).

Finally, the Examiner states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein X is Ni or Co because Ni and Co are disclosed as constituent components of the catalyst. In response, it is again noted that there is nothing in either Sawyer or Velenyi to lead one skilled in the art to applicants' claimed catalyst. Sawyer is devoid of any teaching on how to prepare an unsupported catalyst. The catalyst of Velenyi is unrelated to hydrofining, requires components that are not part of applicants' catalyst, and discloses 26 metals plus combinations for the "M" component with no suggestion as to how to obtain applicants' claimed combination of metals.

Serial No.: 09/869,987
Reply to Office Action of: June 11, 2003
Atty. Docket No.: JHT-0002

Based on the preceding arguments and amendments, the Examiner is requested to reconsider and withdraw all objections and rejections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted:

Date: 8 August 2003

Gerard J. Hughes
Gerard J. Hughes, Reg. No. 41,855
Attorney for Applicants
Telephone No.: (225) 977-4942
Facsimile No.: (225) 977-1025

FAX RECEIVED
AUG 12 2003
GROUP 1700

Correspondence Address:
ExxonMobil Research and Engineering Company
P. O. Box 900
Annandale, New Jersey 08801-0900